

map data in a manner that is consistent with the rendering of other graphical elements on the display element.

[0248] FIG. 25 is a flow diagram of a map system request process 2500 that may be performed by a navigation interface display system according to the present invention. Process 2500 (or portions thereof) may be performed in conjunction with map presentation process 2400. Process 2500 may begin when a presentation layer requests a navigation map (task 2502). In the preferred embodiment, each navigation map can be requested using a designated URL. In response to the map request, the map system retrieves at least a portion of the requested map (task 2504) and the map items located in that portion of the requested map (task 2506). Due to the potentially large map size, different zoom levels, and potentially large number of active and inactive map items, it may not be possible to efficiently retrieve all of the information associated with the requested map. Thus, tasks 2504 and 2506 enable the map system to retrieve a portion or a subset of the requested map. For example, tasks 2504 and 2506 may retrieve the lowest resolution map and a relatively small number of map items for initial display to the end user.

[0249] If global map item filtering is required (query task 2508), then a task 2510 may be performed to apply any necessary global filtering to the current navigation map. In addition, if per-user or individual map item filtering is required (query task 2512), then a task 2514 may be performed to apply such filtering. As described above, the map servers 504 preferably apply global filtering (i.e., filtering that is automatically applied to a number of users) and any user-specified or individual filtering to the requested map. The filtering may reduce the number of map items or otherwise modify the generic map data retrieved by the map system.

[0250] Eventually, the map system sends the map information back to the requesting presentation layer (task 2516). Thereafter, the presentation layer may test whether to apply local filtering to the received map items and/or to the received map data (query task 2518). If so, then the presentation layer can apply any required local filtering (task 2520). As mentioned previously, local filtering may be specific to the particular presentation layer, presentation device, or user preferences.

[0251] Following any local filtering, the presentation layer processes the navigation map information and renders the navigation map using any number of two-dimensional or three-dimensional graphics rendering techniques (task 2522). Of course, map system request process 2500 (or portions thereof) may be repeated for any number of subsequent map requests.

[0252] Streaming Media Portal

[0253] The techniques of the present invention may also be utilized in the context of a network portal or web site that manages access to any number of streaming media files. The following portion of this description and the corresponding figures constitute a portion of United States provisional patent application Ser. No. 60/195,955, the entire content of which is hereby incorporated by reference. For the sake of consistency with the remainder of this description, the following excerpt may differ from the provisional patent application with respect to formatting, figure numbering,

and reference numbering. The following description of a specific implementation is not intended to limit the scope or application of the present invention.

[0254] One aspect of the invention involves a software application and Web site that offers directories of Internet radio stations, while facilitating the ability for the user to conduct "one stop shopping" with an easy to read, graphical display of all available stations, bandwidth information, and other germane data.

[0255] A second aspect of the invention involves the identification of the effect bit rate of streaming media on a global computer network such as the Internet. Currently, the published bit rate of streaming media on the Internet-it is not always as reliable as advertised. The published bit rate doesn't always reflect the effective bit rate users will experience. Because the load on the various servers will vary throughout the day, it is virtually impossible to predict the reliability of a given station. With multiple intermediary servers between the user and broadcaster operating under varying loads, the listener often experiences annoying breaks and skips in the broadcast, resulting in a diminished overall experience. To make the selection process even more arbitrary, many stations do not broadcast 24 hours a day. Some go offline periodically due to server glitches, some are "full" (meaning all their bandwidth is taken), etc.

[0256] As Web broadcasting increases in popularity, users will naturally require an easy-to-use mechanism for locating, filtering, and evaluating the status of available broadcasters. An ideal solution must meet the following criteria:

[0257] Present an interface that is fast, intuitive, and easy-to-use

[0258] Organize stations by broadcast genre

[0259] Suggest other stations that the user might enjoy

[0260] Identify stations broadcasting at a suitable bandwidth, i.e., fast enough to meet the user's minimum quality expectation, but not faster than their Internet connection will support

[0261] Evaluate connections in real-time to assure that stations are broadcasting reliably and that traffic permits a steady connection

[0262] Work with all available broadcast technologies-WMA, MP3, Real Audio, QuickTime, and any future media

[0263] A third aspect of the invention involves an apparatus and method for providing a user interface for selecting streaming media. Instead of taking a traditional hierarchical listing approach, the invention illustrates available sites using a unique, proprietary graphical user interface. In one embodiment, the graphical user interface is a map. This map will feature a mythical group of islands, continents, and seas, each with a set of radio towers representing available broadcasters.

[0264] Each region on the map will be labeled to represent a different genre, with broadcasters' radio towers located within the appropriate genre. Logical sub-regions will represent subsets of a genre. For example, one massive island will be called "Talk Land," and represent talk radio stations.